

Amendment under 37 CFR §1.116
Attorney Docket No.: 052267
Application No.: 10/528,265

REMARKS

Claims 4-13 are pending in the present application. Claims 4-7, 12 and 13 are withdrawn. Claims 8-11 are herein amended. No new matter has been entered.

Claim Rejections – 35 U.S.C. § 112

Claims 8-11 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Office Action states that the limitation “sufficiently large” is indefinite. The limitation has been changed to --larger than--. Support for the amendment is in the specification at, *e.g.*, Fig. 1.

Withdrawal of the rejection is requested.

Claim Rejections – 35 U.S.C. § 103

Claims 8-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Li (US 6,911,129). Favorable reconsideration is requested.

(1) Applicants respectfully submit that Li does not teach or suggest:

binary phase diagrammatic system thin films are deposited on other equilateral triangular regions which respectively adjoin the three sides of said equilateral triangle in said substrate

as recited in amended claims 8-11. Li does not teach this feature, and thus, Li does not teach all of the elements as recited in the claims.

(2) Applicants respectfully submit that Li does not teach or suggest:

a mask; and

a means for moving the mask in one direction on a straight line above or beneath a substrate;

wherein said mask has a periphery orthogonal to said straight line, and a first and a second openings,

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said first opening has a first edge making an angle of 30° to said straight line, said second opening has a second edge making an angle of -30° to said straight line

as recited in claims 8 and 10 and similarly recited in claims 9 and 11, and that these features would not have been obvious.

The Office Action takes the position that mask 58 of Li corresponds with the recited mask. (Office Action, page 3.) The Office Action also cites nuzzle slits 85A-C for corresponding with the recited mask periphery, the first edge of a first opening in the mask and a second edge of a second opening in the mask. (Office Action, page 4.) Mask 58 is a part of the embodiment of Fig. 4 in Li and nuzzle slits 85A-C are part of the embodiment of Figs. 8 and 9 of Li. Thus, the Office Action appears to take the position that it would have been obvious to combine these two embodiments in Li. The Office Action does not provide an explanation of why it would have been obvious to combine these two embodiments.

Applicants first note that nuzzle slits 85A-C do not correspond with a periphery of a mask, and first and second openings of a single mask as alleged by the Office Action. Nuzzle slits 85A-C are individual attachments located at the exits of vapor source chambers and are like "garden hose nozzles" in which movement of a small flow obstruction changes the spread of water that issues from the hose. (Col. 7, lines 26-39.) Thus, since the cited nuzzle slits 85A-C are independent and individual attachments for each respective vapor source, nuzzle slits 85A-C cannot be interpreted as parts of a single mask.

Second, assuming nuzzle slits 85A-C correspond with the periphery, and first and second edges of first and second openings of a single mask as alleged by the Office Action, the nuzzle slits 85A-C do not move relative to the substrate 81, and thus do not form a movable mask. Li

discloses that nuzzle slits 85A-C are arranged over respective edges of a triangle so as to surround substrate 81. (Fig. 9.) Li discloses that the nuzzle slits are arranged independently and a throat associated with the slit produces a desired flow rate that varies in a controllable manner with an angle θ . (Col. 7, lines 26-39.) Thus, nuzzle slits 85A-C do not form a movable mask.

The Office Action cites mask 58 in Fig. 4 as a mask that is movable in a uniaxial direction. (Office Action, page 3.) Mask 58 in Fig. 4 does not have first and second openings with first and second edges, and thus, the Office Action appears to take the position that it would have been obvious to combine the embodiment of Figs. 8 and 9 with the embodiment of Fig. 4.

Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art to combine these two embodiments. The embodiment of Fig. 4 and the embodiment of Figs. 7-9 are two different and independent "approaches" to the invention in Li. (Col. 7, lines 26-28.) Adding nuzzle slits to the exits of vapor sources in Fig. 4 of Li would not produce the effect as illustrated and described regarding the embodiment of Figs. 7-9 because in Fig. 4, the vapor sources exit into pre-disposition chamber 56 where the different vapors mix. (Col. 5, lines 61-65.) The intended effect of the nuzzle slits is to control and change the spread or the relative flow rate that varies with an angle θ on the substrate. (Col. 7, lines 26-39.) This effect would not be achieved when the vapor sources exit into a pre-disposition chamber 56.

Moreover, even if the two embodiments are combined, the combination of nuzzle slits 85A-C, which are attachments at the exits of the vapor source chambers, and mask 58 would not provide a single mask which moves in one direction having a periphery edge and two openings, each with a respective edge.

Therefore, the present invention as recited in claims 8-11 would not have been obvious based on Li because (1) Li does not disclose a single mask which moves in one direction having a periphery edge and two openings, each with a respective edge; (2) it would not have been obvious to combine the embodiment of Fig. 4 with the embodiment of Figs. 7-9; and (3) even if the two embodiments are combined, the modified device still would not have a single mask which moves in one direction having a periphery edge and two openings, each with a respective edge.

(3) Applicants respectfully submit that Li does not teach or suggest:

when said means for moving moves said mask above or beneath said substrate, the movement of said periphery determines a film thickness gradient of a first material, the movement of said first edge determines a film thickness gradient of a second material, and the movement of said second edge determines a film thickness gradient of a third material, thereby a ternary phase diagrammatic system thin film is deposited on said region of equilateral triangle in said substrate

as recited in amended claims 8-11, and that this feature would not have been obvious.

The Office Action cites nuzzle slits 85A-C as corresponding with the recited mask periphery, the first edge of a first opening in the mask and a second edge of a second opening in the mask. (Office Action, page 4.) However, Li does not disclose that nuzzle slits 85A-C move. In other words, there is no moving means for moving nuzzle slits 85A-C such that the movement of each nuzzle slit determines the film thickness gradient for each component. In Li, the nuzzle slits control and change the spread or the relative flow rate that varies with an angle θ on the substrate. (Col. 7, lines 26-39.) The nuzzle slits do not move to form film thickness gradients.

The Office Action combines movable mask 58 of the embodiment of Fig. 4 with nuzzle slits 85A-C. As stated above, one of ordinary skill in the art would not combine these two

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embodiments as explained above. However, even if these two embodiments could be combined, a ternary phase diagrammatic system thin film would not be formed. As stated above, adding nozzle slits to the exits of vapor sources in Fig. 4 of Li would not produce the effect as illustrated and described regarding the embodiment of Figs. 7-9 because the vapor sources exit into pre-disposition chamber 56 where the different vapors mix. (Col. 5, lines 61-65.)

The Office Action responded to arguments (2) and (3) above by citing *In re Keller*, 642 F.2d 413 (CCPA 1981) and *In re Merck & Co.*, 800 F.2d 1091 (Fed Cir. 1986) for the proposition that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. (Office Action, page 5.) The cited cases are not relevant to the present case because the claims in the present case were rejected by citing one reference. The Office Action did not cite a combination of references and thus, our arguments did not address a combination of references. The arguments addressed only one reference, *i.e.*, Li.

Second, the Office Action cites *In re Keller* for the proposition that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, nor is it that the claimed invention must be expressly suggested in any one or all of the references; rather the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. As stated above, *In re Keller* has a different fact situation because it refers to a combination of references. However, the situation in the present case could be considered analogous to *In re Keller* in that the claims were rejected by combining two embodiments within a reference, and thus, the test in *In re Keller* could logically be extended to the present situation. The test in *In re Keller* could be

applicable to a combination of embodiments within a reference, *i.e.*, the test is what the combined teachings of the embodiments within a reference would have suggested to those of ordinary skill in the art.

Contrary to the statement in the Office Action implying that Applicants addressed the embodiments individually, Applicants note that the detailed arguments above address both embodiments disclosed in Li and explain why it would not have been obvious to one of ordinary skill in the art to combine the two embodiments.

Specifically, Applicants previously stated that the embodiment of Fig. 4 and the embodiment of Figs. 7-9 are two different and independent “approaches” to the invention in Li. (Col. 7, lines 26-28.) Adding nuzzle slits to the exits of vapor sources in Fig. 4 of Li would not produce the effect as illustrated and described regarding the embodiment of Figs. 7-9 because in Fig. 4, the vapor sources exit into pre-disposition chamber 56 where the different vapors mix. (Col. 5, lines 61-65.) The intended effect of the nuzzle slits is to control and change the spread or the relative flow rate that varies with an angle θ on the substrate. (Col. 7, lines 26-39.) This effect would not be achieved when the vapor sources exit into a pre-disposition chamber 56. Based on the combined teachings of these two embodiments, one of ordinary skill in the art would understand that the result achieved from the embodiment of Figs. 7-9 could not be achieved by applying nuzzle slits 85A-C to exits of vapor sources in Fig. 4 and thus, such a combination is not suggested to those of ordinary skill in the art.

The Office Action also takes the position that sources 53A-C in Fig. 4 of Li are capable of supplying sources individually, and thus, the device is capable of forming a ternary layer. Applicants respectfully submit that the embodiment of Fig. 4 does not include a movable mask

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having a periphery and first and second edges as recited in the claims. Second, if the embodiment of Fig. 4 is modified to include nuzzle slits 85A-C to correspond with the recited action edges of the mask as alleged by the Office Action, the modified device would have three separate masks, and these masks would not be movable. The nuzzle slits would be attached to the individual sources 53A-C which are not movable. Third, the nuzzle slits in the modified device would not provide a masking effect. The gas would exit the nuzzle slits and enter the pre-deposition chamber. From the pre-deposition chamber, the gas is pushed out to the substrate which is masked by mask 58. The nuzzle slits would have no impact on the resulting layer on the substrate.

(4) Applicants respectfully submit that Li does not teach or suggest:

said periphery has a length which is larger than a region of equilateral triangle in said substrate,

each of said first and second edges has a length which is larger than said region of equilateral triangle in said substrate

as recited in amended claims 8 and 9; and

said periphery has a length which is larger than a region of equilateral triangle in said substrate,

said first opening has a size which is larger than said region of equilateral triangle in said substrate,

said second opening has a size which is larger than said region of equilateral triangle in said substrate

as recited in amended claims 10 and 11.

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In Fig. 9 in Li, when the three nuzzle slits 85A-C and the substrate 81 are compared, the slit width of the nuzzle slits 85A, 85B, and 85C (the shorter length in the figure) are substantially equal to one edge of the substrate 81.

In the present invention, each of the single action edges 11a, 11b, and 11c in the mask 10 shown in Fig. 1 is longer than one edge of the triangle 12a of the substrate 12 (namely, the region where the thin film of ternary phase-diagrammatic system is formed). Also, as shown in Fig. 1 of the present invention, the first and the second openings are larger than the triangle on the substrate 12 (the region where the thin film of ternary phase-diagrammatic system is formed).

For at least the foregoing reasons, claims 8-11 are patentable over the cited references. Accordingly, withdrawal of the rejection of claims 8-11 is hereby solicited.

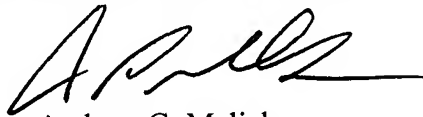
In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

A handwritten signature in black ink, appearing to read 'A. Melick', written in a cursive style.

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